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Jep Gibney (V. P.)

A CASE OF SLOW AND ONE OF SWIFT

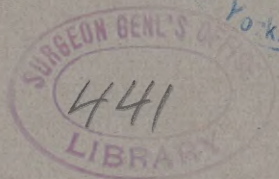
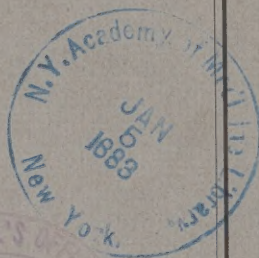
COMPRESSION OF THE SPINAL CORD

From Dislocation of the Odontoid
Process.

BY

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[See 3d page of cover.

A CASE OF SLOW AND ONE OF SWIFT COMPRESSION OF THE SPINAL CORD FROM DISLOCATION OF THE ODONTOID PROCESS.¹

BY

V. P. GIBNEY, A.M., M. D.

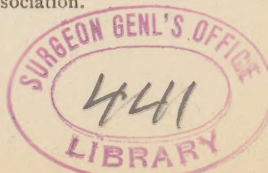
Professor of Orthopædic Surgery in the New York Polyclinic.

CASE I.—LEFT HEMIPLEGIA OF SPINAL ORIGIN, WITH TORTICOLLIS; DEATH AT END OF FOURTH MONTH; AT THE AUTOPSY, ODONTOID PROCESS FOUND DISPLACED AND CORD COMPRESSED.

E. D——, male, *æt.* 11 years, was admitted to the Hospital for the Ruptured and Crippled, March 16, 1882. The family history contained nothing bearing upon the case. Until a year ago he had been subject to epileptic fits. In September, 1881, a playfellow gave him a severe blow on the neck with his hand, and on the following day it was observed that the head was held a little awkwardly, and pain at the occiput was well marked. From this dates a torticollis. The cervical glands proceeded to suppuration, and two months from the date of the blow above recorded an abscess was opened.

The patient's first appearance in the outdoor department was on the 27th of February, and from a cursory examination I made a diagnosis of left spinal hemiplegia, with simple spondylitis, and advised admission to the hospital. A more thorough examination was made March 1st. There was a half-inch atrophy in both superior and inferior ex-

¹ Read at the last meeting of the American Neurological Association.



trémities. The arm hung limp by the side, and the foot was brought to the floor, as he walked, with a "flop." Although not very lame, the gait was characteristically hemiplegic. By great effort he could raise the arm from the side a distance of twelve inches, the suprascapular muscles seeming to execute the act. He could feebly flex the forearm, and the finger flexors were so strongly contracted that he could not use the dynamometer. The entire limb was hyperæsthetic, but the degree of hyperæsthesia was not ascertained. All the muscles responded to both currents, with diminished contractility in the atrophied groups. The tongue, on protrusion, deviated to the left side very perceptibly, while the uvula deviated to the right. The tonsils were very large, and it was with considerable difficulty that the posterior pharyngeal wall could be thoroughly explored with the finger. This examination, however, was attended with absolutely negative results. The head was rotated to the left and tilted to the right. Passive movements, if carried to extremes, were resisted very much. An unnatural projection in the post-cervical region to the left side and near the occiput seemed to be the spinous process rotated out of the vertical axis.

The examination was completed on the 16th, the date of his admission to the hospital. Moderate spinal concussion gave no pain, but on pressure over the projecting spinous processes there was decided tenderness. The deltoid was much atrophied; pronation and supination barely possible; flexion and extension of the hand and fingers ditto, although there was no appreciable atrophy of the hand. The patellar reflex and the foot clonus were greatly exaggerated. The extensors of the thigh were weak, but not palsied. The flexors and extensors of the leg possessed less than normal power, and active dorso-flexion of the foot was quite impossible. No contractions about knee or foot existed. He

has had an ulcerative keratitis of right eye, with much conjunctival hyperæmia.

His head was suspended in a spring attached to a spinal brace, and faradism daily was begun. The keratitis became so alarming that by the advice of Dr. Agnew he was transferred to the Manhattan Eye and Ear Hospital, April 1, when it was noted that most decided improvement had taken place in the deltoid, and indeed in all the muscles of the limb. The head support had proven of undoubted value. During his stay in the Manhattan—one week—Dr. Seguin very kindly continued the electrical treatment. The eye symptoms subsided promptly, and the case altogether did well. The parents removed him from our hospital on the 13th.

April 22. Dr. Seguin reported yesterday that the patient had been re-admitted to the Manhattan, coming under his care, and that in a few days he became perfectly helpless. The case was discharged, and the mother advised to place it again under orthopædic treatment. His advice was not taken.

The subsequent history was obtained April 30, the day of the autopsy, twenty hours after death, Dr. Seguin and Dr. Geo. W. Ryan being with me on that occasion. Very soon after leaving the Manhattan the paralysis became complete, and at times he suffered from violent spasmodic action of muscles of the extremities. He complained much of occipital and frontal headache, and slowly lost ground up to the evening of the 28th, when he passed a restless night, though his symptoms did not seem at all alarming. On the following morning, about six, he attempted to rise, gave a wild stare, a gasp or two, and expired. He had no convulsion, no facial contortion, no squint.

The spinal column was opened from behind in the upper two-thirds of its extent. The spinous and transverse pro-

cesses of the second cervical vertebra were unusually prominent, and it was our opinion that they were considerably enlarged as well as very hard. No pus cavity could be found, and the spinal canal throughout its cervical and dorsal regions presented nothing abnormal; no softening of the bodies. The cord was carefully removed and its coverings presented no pathological changes. The brain was examined thoroughly and no lesion discovered. On removing the cerebellum with the medulla and upper portion of the cord the odontoid process was found tilted backwards, almost completely obliterating the spinal canal. The accompanying drawing, by Dr. Wm. G. Bull, illustrates the appearance of the parts.

The tip of the little finger could with difficulty be pushed through the foramen magnum, and if the head were flexed on the sternum it was quite impossible to so introduce the finger. The process was not denuded of periosteum, but was loose at its base, and the apex tipped towards the left.

The spinal cord and the lower portion of the medulla in this vicinity were very soft, quite limp, and a marked indentation was seen in front, caused apparently by the odontoid process. It was not learned how the ligaments became involved, but it was presumed that the spondylitis had brought about their detachment.

Dr. Birdsall has made a report on the sections I made, and to him I am likewise much indebted for the drawings which accompany his report.

REPORT BY DR. W. R. BIRDSALL.—The specimens presented to me by Dr. Gibney for examination consisted of sections, stained in carmine, and mounted in balsam, from (*a*) the decussation, (*b*) the superior cervical cord—compressed portion—and (*c*) the middle cervical cord.

In *a* no evidences of disease were observed. In *b*, represented by Figs. 1 and 2, Plate I., the whole section presents

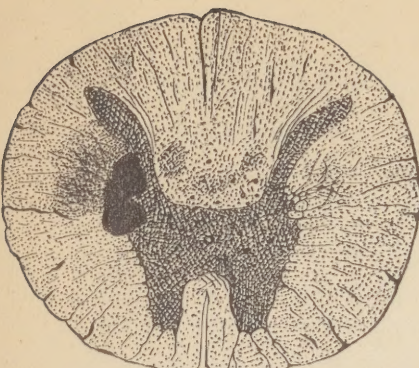


FIG. 1 (see note, p. 6).

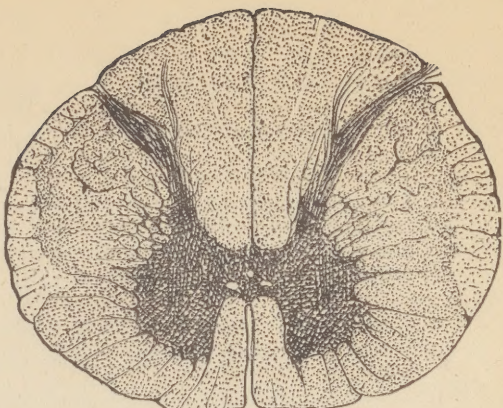


FIG. 3 (see note, p. 6).

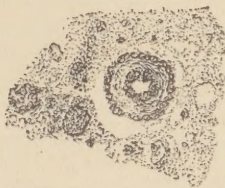
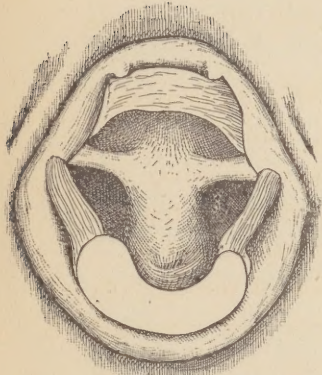
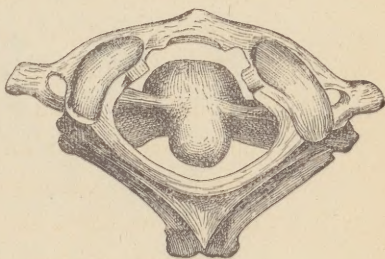


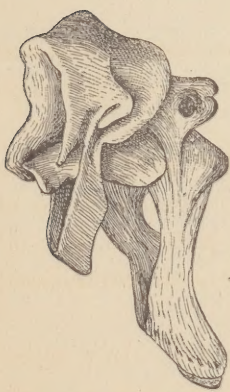
FIG. 2 (see note, p. 6).



See p. 4.



See p. 4.



See p. 4.

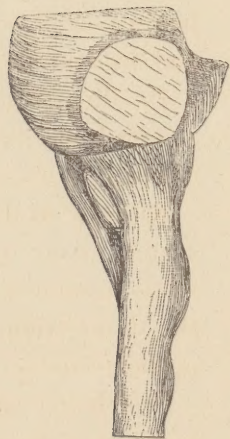


FIG. 1, p. 7.



a cloudy appearance, the usually distinct outline of the axis cylinders and their medullary envelope being absent except in the peripheral portions or at the extreme margins of the lateral columns. In all other portions there exist, in varying degrees, swelling of the medullary sheath and also of the axis cylinders, great numbers of lymphoid elements, myelin drops, granule cells and granular detritus, the latter forming in certain portions small, irregular, yellowish patches of completely disorganized matter (represented in deep black, Fig. 1), occupying the inner portion of the left crossed-pyramidal tract, involving the neighboring gray matter. Another less marked patch exists in the corresponding column of Burdach, and a few specks in the right crossed-pyramidal tract. The lateral portions of the left crossed-pyramidal tract exhibit, to a marked degree, the changes above described, and, in addition, hypertrophy of the neuroglia, the septa, and the walls of the blood-vessels. The right crossed-pyramidal tract presents similar changes, though much less marked. Other portions of the lateral and posterior columns are irregularly streaked, as shown in Fig. 1; the darker portions representing the parts most affected. The most decided changes exist in the central portion of the columns of Burdach and the gray matter about the central canal, involving the central gray columns, showing in some portions almost complete disorganization, all traces of the neural elements having disappeared, leaving a mass of granules, granule cells, lymphoid elements, myelin drops, with numbers of hypertrophic and occluded blood vessels. (The latter appear in Fig. 1 as black dots, and in Fig. 2 more highly magnified.) These vessels are a striking feature of the specimen. All the layers seem to be involved in the hypertrophy. Complete occlusion may be frequently observed. No perivascular spaces are to be seen, but many vessels appear to be encased by one or more

layers of lymphoid elements. The extreme portions of the anterior horns appear normal, while the posterior horns are richly infiltrated with lymphoid elements.

An interesting feature is that the central portions of the cord, and not the periphery, suffered most from the compression. The vascular changes were decided in this region only. The interference with the circulation of this, most vascular region of the transverse area of the cord is probably the most important factor in the production of the lesion.

In *c*, below the point of compression, the column of Türk and the greater part of the remaining portion of the anterior columns, the posterior columns, and the direct cerebellar tract are normal. The crossed-pyramidal tracts, particularly the left, exhibit hypertrophy of the neuroglia and septa, distinguishable from sclerosis of chronic myelitis by the absence of Deiters' cells and induration of the neuroglia and septa. The neural elements are in a fair state of preservation, and the decided vascular changes seen in the compressed portion are absent. The gray matter, with the exception of increased vascularity, is normal. In other words, the changes are limited to the crossed-pyramidal tract, except when they involve the anterior portion of the left lateral column, or most abnormal side. The outline of the direct cerebellar tract is as distinct in the specimen as represented in Fig. 3, and the asymmetry in the anterior horns is correctly represented.

Fig. 1.—Transverse section of cord in the superior cervical region, compressed portion. Right side represents left half of cord.

Fig. 2.—A portion of the column of Burdach, adjoining posterior commissure, showing hypertrophied artery. No. 6 Véric, Obj., No. 3, *a*.

Fig. 3.—Transverse section of cord in middle cervical region, below compressed portion. Right side represents left half of cord.

CASE II.—CASEOUS OSTITIS AT THE OCCIPITO-ATLOID ARTICULATION AND OF THE BODY AND ODONTOID PROCESS OF THE ATLAS.

This case has been used in a paper by Dr. Yale¹ to illustrate disease in the upper cervical vertebra, and the notes I then furnished him are reproduced in this communication. It furnishes such excellent specimens of myelitis of the anterior horns that I have reserved the cord and the drawings for a future report. The gross appearances are well represented in the drawing made by Dr. Amidon. [Fig. 1.]

The history is as follows:

January 19, 1880.—For at least a week the patient, a male, *æt.* 15, has had a stiff neck, which is thought to have come from a cold. Later, it was discovered that a week before the appearance of the symptoms he had fallen backward, striking his head against the floor with considerable force. Liniments ineffectual. No infiltration; tenderness along *ligamentum nuchæ*; blister to nape.

January 21.—No relief from blister. Ergot 3 ss., t.i.d. No appreciable rise in temperature; pulse and respiration normal. Keeps bed simply from holding head erect.

January 22.—Ergot not retained.

January 26.—Still unrelieved. In fact there now appears to be a subacute cellulitis, probably involving the cervical fascia. No enlargement of *vertebræ* to be felt in the fauces; and no prominence to be felt posteriorly, and, indeed, a careful examination fails to detect any vertebral disease.

January 28.—Belladonna lotion. Ergot again, not borne; followed by a blister.

On February 8, the entry is continued: "No material change. * * * * Can this be a case of pachymeningitis cervicalis hypertrophica, with extension of disease along

¹ Medical Record, Nov. 13, 1880, p. 553.

nerve sheaths, causing a peripachymeningitis, or is it simply a rheumatic form of an inflammation affecting cervical fascia?"

February 9.—On right side, just back of the mastoid process, is a tumor barely perceptible.

February 10.—Spinal brace and head spring applied. Is now out of bed.

February 15.—Gets much support from the head spring, but dislikes the body brace very much. Tumor enlarging slowly. Some tenderness.

March 30.—Incision made an inch deep before pus is reached. Leech and poultice. Temperature, 103° .

March 31, A. M.—In an attempt to enlarge the opening, a branch of the occipital artery (probably the princeps cervicis) is divided and at least a half ounce of blood lost. Compress proves effectual; brandy freely administered. Temperature, P. M., 103° .

April 2.—Discharge very slight. He suffers so much that he begs to sleep in his rolling-chair, the pain on lying down being excessive.

April 5.—A probe inserted fully two inches into the sinus touches bare bone, and with this instrument passed three times daily the deep parts are kept open. He complains of great pain in the neck on the left side, but nothing more than glandular enlargement can here be discovered.

April 9.—Pains so great as to require the constant use of iced cloths. The patient dislikes morphia, and potassium bromide in forty grain doses is employed instead.

April 11.—Delirium, due apparently to the extreme degree of anæmia. The discharge is more free and he looks every way better.

April 17.—Under hot fomentation he seems to get relief from pain. Complains of difficulty in breathing, of soreness of the throat, and for a week or two he has been unable to

take solid food; takes liquid food even with a tube. Breathes heavily in sleep.

April 19.—Complains this morning of being unable to breathe through his nose, and an examination reveals a post-pharyngeal abscess. A bistoury is promptly inserted and fully two ounces of pus evacuated. The pus is thick, and towards the end about a drachm of caseous material like bone detritus flows out of the incision. The sac is washed with a weak solution of acid carbolic, and the dyspnoea is immediately arrested.

April 22.—No discharge from the mastoid abscess and the tumefaction greatly diminished. The fomentations are discontinued, and by 10 P. M. there is great increase in size of the tumor.

May 2.—He is simply vegetating, is growing more and more emaciated, and while the discharge is thin and less profuse the tenderness of the parts is as great.

May 3.—By reason of his loss of flesh, it is next to impossible to fit any form of apparatus that will be at all comfortable. His position in the chair is a painful one; yet he dreads going to bed, and much against his will he is placed in the dorsal decubitus, all apparatus being removed. He asks to be turned on his side, and as this is done he screams aloud, and the agony is so great that his eyes seem to start from their sockets. The extreme helplessness of the limbs becomes very noticeable. After awhile he gets into an easy position and he lies with little suffering until 4 P. M., when his speech becomes difficult; he faints away, and then rallies a little under stimulants.

At 5 P. M. the nurse reports that he attempted to turn his head and raise himself from the pillow, when he suddenly became deathly pale; the respiration ceased, and on reaching his bed a few moments later I found life nearly extinct. He was lying on his back, chin on sternum. After a few pulse

beats and gasps he died. After death I explored the pharynx with my finger, finding the sac of the abscess empty and the glottis clear.

Autopsy, twenty hours after death, Dr. E. G. Janeway superintending. Present: Dr. Poore and the house staff. Thorax and abdomen not examined. Spinal canal exposed by sawing through the arches and removing the spinous processes throughout the whole length. The cord is carefully removed. No evidence found at any point of meningitis, acute or chronic; no tubercles; in the upper portion of the cervical region, anteriorly, the dura was a little thickened, due, perhaps, to an old pachymeningitis externa. Sections of the cord made in the lumbar enlargement, and all that could be discovered microscopically is a cloudiness of the gray horns anteriorly, with a diminution in their size. This condition exists apparently throughout the whole of the lumbar portion. There are, however, no very marked changes discovered. The cephalo-rachidian fluid normal in quantity and appearance. The bodies of the vertebræ are carefully examined from behind, and no evidence of caries found. As the mastoid abscess is enlarged and explored with the finger there can be felt one or two bits of rough, hard bone, probably separated by saw and chisel. The condyles of the occiput are felt bare and eroded.

The dura of the calvarium is found very firmly adherent. On removing the cephalic mass nothing abnormal is encountered until the medulla is reached. Against its anterior surface, just below the decussation, a bony process is found projecting, which proves to be the odontoid. After removal of the brain quite a depression is recognized in the medulla at its junction with the cord.

On flexing the head upon the spine, the odontoid can be seen plainly moving backward and forward. On inserting finger into the foramen magnum there is felt, toward the

right side, a small bit of eroded bone, found to be the point of insertion of the check ligaments, both these and the transverse ligament being, to all appearance, separated by disease of the bones at their attachments, thus allowing the displacement described. The mastoid process seems normal.

THE AMERICAN JOURNAL OF NEUROLOGY AND PSYCHIATRY is intended to serve as a medium of information on neuropathology for the neurological specialist, as well as the general practitioner of medicine. While every effort will be made to render its pages available to the non-specialist, their contents will be chiefly limited to the field indicated in the title. Particular attention will be given to that important, but too often neglected topic: the nervous element in ordinary and general diseases. In the last decade the progress in neurology has been so great that in almost all diseases observation and experiment have shown that the nervous system participates largely in etiology, pathology, and symptomatology, and to such a degree that its study has now become a necessity. The time, therefore, is certainly ripe for the establishment, in this city, of a journal devoted to a subject, whose mastery, requiring long and careful special study, necessitates a closer relationship between the neurologist and the general practitioner.

THE JOURNAL WILL CONTAIN THE FOLLOWING DEPARTMENTS:

I. Original Monographs and Essays.

II. Clinical and pathological records of individual cases.

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V. Reports on Society Proceedings: These will consist of brief abstracts of the papers read and the discussions to which these give rise, at the meetings of the various societies devoting attention to Neurology and Medical Jurisprudence. Only papers and discussions of interest will be reported, and arrangements have been made to secure reports from the chief medical centres of the Union.

VI. Reviews. The editors, persuaded that perfunctory or biased reviews of books are either unjust to the author, or unjust to the medical reading public, frequently to both, will strive to have this class of critiques in their journal to fulfill the true purposes of criticism, and fearlessly, justly, and impersonally give praise where it is due, censure where it belongs, judging of the given work as a whole by a high yet practicable standard.

VII. Quarterly reports on progress in the various branches of neurological science, namely of (a) Anatomy, (b) Physiology, (c) Patho-Anatomy, (d) General Clinical Neurology, (e) Psychiatry, (f) Therapeutics, (g) Medical Jurisprudence, (h) Anthropology.

VIII. Items of interest, personal notices and editorial comments.

There will be also issued, with each annual volume, a supplement in the shape of a treatise, on some subject relating to Nervous and Mental Pathology. The supplement for the first volume will consist of the Essay on the Somatic Etiology of Insanity, to which the W. & S. Tuke Prize was awarded by the British Medico-Psychological Association. The supplement will be separately paged, and will, at the end of the year, constitute a volume suitable for binding.

A limited number of reprints will be furnished to authors of larger articles, if the request accompanies the manuscript.

